

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A photoreceptive amplifier circuit for amplifying and outputting a signal from a photoreceptor on which optical signals of plural types of wavelength are supplied, comprising:

a former-stage amplifier for receiving the signal from the photoreceptor,

a latter-stage amplifier for amplifying output of the former-stage amplifier,

the former-stage amplifier including a feedback resistor and the latter-stage amplifier including resistors for determining sensitivity, a plurality of resistor groups each of which is made up of the feedback resistor and the resistors being provided so that at least a part of the resistor groups corresponds to each of plural types of wavelength, a temperature coefficient in a conversion efficiency for each wavelength in the photoreceptor being made zero by a temperature coefficient in each of the resistor groups which corresponds to each wavelength~~the feedback resistor and at least a part of the resistors for determining sensitivity being made of different resistive elements having different temperature characteristics, the resistive elements varying depending on the types of wavelengths of the optical signals.~~

2. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, wherein:

the latter-stage amplifier is provided at a second-stage corresponding to the respective types of wavelengths, so as to operate as a differential amplifier circuit for simultaneously receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the differential amplifier circuit including the resistors for determining sensitivity made up of input resistors, input voltage dividing resistors, and feedback resistors, which have different~~differ to each other in temperature characteristics~~ coefficients,

the differential amplifier circuit ~~being switched so as to select~~ being capable of selecting, depending on the wavelength of the optical signals, one of the resistive elements resistors included in the resistors for determining sensitivity.

3. (Previously Presented) The photoreceptive amplifier circuit as set forth in claim 2, further comprising:

a reference amplifier at a same stage as the former-stage amplifier, the reference amplifier having a same structure as that of the former-stage amplifier but not connected to the photoreceptor, the differential amplifier circuit calculating difference between the former-stage amplifier and the reference amplifier.

4. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, wherein:

the latter-stage amplifier is provided at a second-stage corresponding to the respective types of wavelengths, so as to operate as a differential amplifier circuit for simultaneously receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the differential amplifier circuit including the resistors for determining sensitivity made up of dividing resistors for dividing output in accordance with a reference voltage which is specified in advance, the dividing resistors having different temperature characteristics coefficients in different parts of the differential amplifier circuit, the differential amplifier circuit ~~being switched so as to select~~ selecting one of the resistive elements.

5. (previously presented) The photoreceptive amplifier circuit as set forth in claim 2, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

6. (Previously Presented) The photoreceptive amplifier circuit as set forth in claim 3, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

7. (Previously Presented) The photoreceptive amplifier circuit as set forth in claim 4, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

8. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, further comprising:

a reference amplifier at a same stage as the former-stage amplifier, the reference amplifier having a same structure as that of the former-stage amplifier but not connected to the photoreceptor,

wherein:

the former-stage amplifier and the reference amplifier respectively include feedback resistors which ~~differ to each other in~~ have different temperature-characteristic coefficients, corresponding to the plural types of wavelengths

the latter-stage amplifier is provided at a second-stage, so as to operate as a differential amplifier circuit for receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the former-stage amplifier and the reference amplifier each including a switch for selecting one of the resistive elements, the switch calculating difference between respective outputs from the former-stage amplifier and the reference amplifier so as to select one of the feedback resistors in accordance with the difference.

9. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, wherein:

the feedback resistor and the resistors for determining sensitivity are respectively made of two different kinds of diffused resistor having different temperature-characteristics coefficients.

10. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, wherein:

the feedback resistor and the resistors for determining sensitivity are respectively made of a diffused resistor and a polysilicon resistor which have different temperature-characteristics coefficients.

11. (Currently Amended) The photoreceptive amplifier circuit as set forth in claim 1, wherein:

the feedback resistor and the resistors for determining sensitivity are respectively made of two different kinds of polysilicon resistor having different temperature-characteristics coefficients.

12. (Currently Amended) An optical pickup element including a photoreceptive amplifier circuit for amplifying and outputting a signal from a photoreceptor on which optical signals of plural types of wavelength are supplied, comprising:

a former-stage amplifier for receiving the signal from the photoreceptor,

a latter-stage amplifier for amplifying output of the former-stage amplifier,

the former-stage amplifier including a feedback resistor and the latter-stage amplifier including resistors for determining sensitivity, a plurality of resistor groups each of which is made up of the feedback resistor and the resistors being provided so that at least a part of the resistor groups corresponds to each of plural types of wavelength, a temperature coefficient in a conversion efficiency for each wavelength in the photoreceptor being made zero by a temperature coefficient in each of the resistor groups which corresponds to each wavelength~~the feedback resistor and at least a part of the resistors for determining sensitivity being made of different resistive elements having different temperature characteristics, the resistive elements varying depending on the types of wavelengths of the optical signals.~~

13. (Currently Amended) The optical pickup element as set forth in claim 12, wherein:

the latter-stage amplifier is provided at a second-stage corresponding to the respective types of wavelengths, so as to operate as a differential amplifier circuit for simultaneously receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the differential amplifier circuit including the resistors for determining sensitivity made up of input resistors and feedback resistors, which ~~differ to each other in~~ have different temperature characteristics coefficients,

the differential amplifier circuit ~~being switched so as to select~~ selecting, depending on the wavelength of the optical signals, one of the resistive elements resistors included in the resistors for determining sensitivity.

14. (Previously Presented) The optical pickup element as set forth in claim 13, further comprising:

a reference amplifier at a same stage as the former-stage amplifier, the reference amplifier having a same structure as that of the former-stage amplifier but not connected to the photoreceptor, the differential amplifier circuit individually calculating difference between the former-stage amplifier and the reference amplifier.

15. (Currently Amended) The optical pickup element as set forth in claim 12, wherein:

the latter-stage amplifiers is provided at a second-stage corresponding to the respective types of wavelengths, so as to operate as a differential amplifier circuit for simultaneously receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the differential amplifier circuit including the resistors for determining sensitivity made up of dividing resistors for dividing output in accordance with a reference voltage which is specified in advance, the dividing resistors having different temperature ~~characteristics~~ coefficients in different parts of the differential amplifier circuit, the differential amplifier circuit ~~being switched so as to select~~ selecting one of the resistive elements.

16. (Previously Presented) The optical pickup element as set forth in claim 13, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

17. (Previously Presented) The optical pickup element as set forth in claim 14, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

18. (Previously Presented) The photoreceptive amplifier circuit as set forth in claim 15, wherein:

the optical signals have two kinds of wavelengths,

the differential amplifier circuit is provided as two differential amplifiers, each of which includes a pair of transistors constituting a differential pair and constant-current sources for supplying current to the differential pair, the two differential amplifiers further including a single common output transistor,

one of the constant-current sources becomes active with a corresponding differential amplifier which is selected according to the type of wavelength, while the other constant-current source becomes inactive.

19. (Currently Amended) The optical pickup element as set forth in claim 12, further comprising:

a reference amplifier at a same stage as the former-stage amplifier, the reference amplifier having a same structure as that of the former-stage amplifier but not connected to the photoreceptor,

wherein:

the former-stage amplifier and the reference amplifier respectively include feedback resistors which ~~differ to each other in~~ have different temperature-characteristic coefficients, corresponding to the plural types of wavelengths

the latter-stage amplifier is provided at a second-stage, so as to operate as a differential amplifier circuit for receiving output of the former-stage amplifier and supplying outputs of the photoreceptive amplifier circuit,

the differential amplifier circuit selecting one of the resistive elements by using a switch, which calculates difference between respective outputs from the former-stage amplifier and the reference amplifier and ~~select~~ selects one of the feedback resistors in the former-stage in accordance with the difference.

20. (Currently Amended) The optical pickup element as set forth in claim 12, wherein:

the feedback resistor and the resistors for determining sensitivity are respectively made of two different kinds of diffused resistor having different temperature-characteristics coefficients.

21. (Currently Amended) The optical pickup element as set forth in claim 12, wherein:

the feedback resistor and the resistors for determining sensitivity are made of a diffused resistor and a polysilicon resistor which have different temperature-characteristics coefficients.

22. (Currently Amended) The optical pickup element as set forth in claim 12, wherein:

the feedback resistor and the resistors for determining sensitivity are respectively made of two different kinds of polysilicon resistor having different temperature-characteristics coefficients.